

What is claimed is:

1. A method for fabricating a metallic oxide film of high dielectric constant, comprising the steps of:  
epitaxially growing a given metallic oxide film on a substrate, and  
thermally treating said substrate and said metallic oxide film to mix constituent elements of said substrate with constituent metallic oxide elements of said metallic oxide film and to form said metallic oxide film of high dielectric constant on said substrate.
2. The fabricating method as defined in claim 1, wherein said substrate includes Si.
3. The fabricating method as defined in claim 1, wherein said metallic oxide film is made of at least one selected from the group consisting of  $\text{Pr}_2\text{O}_3$ ,  $\text{SrTiO}_3$ ,  $\text{CeO}_2$ ,  $\text{ZrO}_2$  and  $\text{Y}_2\text{O}_3$ .
4. The fabricating method as defined in claim 1, wherein said thermal treatment is performed within a temperature range of 900-1100°C.
5. The fabricating method as defined in claim 1, wherein said thermal treatment is performed under non-oxidizing atmosphere.
6. The fabricating method as defined in claim 5, wherein said non-oxidizing atmosphere is nitrogen atmosphere.
7. The fabricating method as defined in claim 1, wherein said thermal treatment is performed under atmospheric pressure.
8. The fabricating method as defined in claim 4, wherein in said thermal treatment, heating rate up to said temperature range is set to 50-100°C/sec.
9. The fabricating method as defined in claim 1, wherein said metallic oxide film of high dielectric constant is amorphous.
10. The fabricating method as defined in claim 1, wherein relative dielectric constant of said metallic oxide film of high dielectric constant is 20 or more.
11. The fabricating method as defined in claim 1, wherein no interface layer is formed between said substrate and said metallic oxide film of high dielectric constant.
12. A metallic oxide film of high dielectric constant made by a fabricating method as defined in claim 1.

13. The metallic oxide film as defined in claim 12, which is formed on a given substrate not via an interface layer.

14. The metallic oxide film as defined in claim 13, which is formed in amorphous.

15. The metallic oxide film as defined in claim 13, wherein said substrate includes Si.

16. The metallic oxide film as defined in claim 15, which includes at least one selected from the group consisting of  $\text{Pr}_2\text{O}_3$ ,  $\text{SrTiO}_3$ ,  $\text{CeO}_2$ ,  $\text{ZrO}_2$  and  $\text{Y}_2\text{O}_3$ .

17. The metallic oxide film as defined in claim 12, which has relative dielectric constant of 20 or more.

18. A gate insulating film made of a metallic oxide film of high dielectric constant as defined in claim 12.

19. A semiconductor element including a gate insulating film as defined in claim 18.